

**Notice of Allowability**

Application No.

09/730,603

Examiner

Curtis B. Odom

Applicant(s)

WU ET AL.

Art Unit

2634

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amdt filed on 9/27/2005.
2. ☒ The allowed claim(s) is/are 1-52.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                      |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance             |
|   | 9. <input type="checkbox"/> Other _____  |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Andrew Bateman on 10/13/2005.

The application has been amended as follows:

Claim 10 (currently amended). The method of Claim 9, further comprising the steps of:

- l. determining if  $i$  is less than a first predetermined value;
- m. repeating steps a-c, if in step l,  $i$  is less than the first predetermined value;
- n. determining if the sum in step i is less than a second predetermined value; and
- o. outputting the hard information if  $i$  is at least the first predetermined value and the sum in step i is less than the second predetermined value.

Claim 14 (currently amended). The computer program of Claim 13, further comprising the steps of:

- d. updating, for each parity check equation, the smallest  $\text{llrQ}_{lm}$  calculated in step c, at iteration  $i$ ;

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e. updating, for each parity check equation, the second smallest  $\text{llr}Q_{lm}$  calculated in step c, at iteration  $i$ ; and

f. updating, for each parity check equation, an overall sign of  $\text{llr}Q_{lm}$ , calculated in step c, at iteration  $i$ ,

wherein step a is responsive to step d, step e, and step f, and

wherein step is responsive to step a.

Claim 23 (currently amended). The computer program of Claim 22, further comprising the steps of:

- l. determining if  $i$  is less than a first predetermined value;
- m. repeating steps a-c, if in step l,  $i$  is less than the first predetermined value;
- n. determining if the sum in step i is less than a second predetermined value; and
- o. outputting the hard information if  $i$  is at least the first predetermined value and the sum in step i is less than the second predetermined value.

Claim 36 (currently amended). The decoder of Claim 35, further comprising:

first threshold means for determining if  $i$  is less than a first predetermined value,

wherein the calculations by said first and second calculating means are repeated if  $i$  is less than the first predetermined value as determined by said first threshold means; and

second threshold means for determining if the sum by said summing means is less than a second predetermined value; and

wherein the hard information is output if  $i$  is at least the first predetermined value and the sum by said summing means is less than the second predetermined value.

Claim 49 (currently amended). The decoder of Claim 48, further comprising:

first threshold detector to determine if  $i$  is less than a first predetermined value,

wherein the calculations by said first and second calculator are repeated if  $i$  is less than the first predetermined value as determined by said first threshold detector; and

second threshold detector to determine if the sum by said summer is less than a second predetermined value; and

wherein the hard information is output if  $i$  is at least the first predetermined value and the sum by the summer is less than the second predetermined value.

#### **EXAMINER'S STATEMENTS OF REASONS FOR ALLOWANCE**

2. The following is an examiner's statement of reasons for allowance: Claims 1-52 are allowable over prior art because related references do not disclose decoding low-density parity-check codes by calculating information from a bit node to an equation node, decision aided equalizing in response to the calculation, and calculating information from the equation node to the bit node in response to the equalizing.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

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fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

*Conclusion*

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom  
October 12, 2005



**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINER**  
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